TERRA DOLCE CONSULTANTS, INC.
4706 NE 75TH AVE
PORTLAND, OREGON 97218
503-502-5114

February 28, 2019
Project No 864-001

Craig Hultgren, LHG
Principal Geologist/Vice President
1339 Commerce Avenue, Suite 211
Longview, WA 98632

BACKFILL PLAN
1-84/LINDSEY LAKE EMERGENCY SPILL RESPONSE
HOOD RIVER OREGON

Dear Craig,
Terra Dolce Consultants, Inc. (TDC) is pleased to present our backfill plan for the referenced project. The plan is based our February 22 2019 Site Visit and our February 25 2019 Geotechnical Engineering Site Evaluation.

INTRODUCTION

The project site is located approximately 14 miles west of Hood River, Oregon (see Figure 1). On February 11, 2019, a truck carrying diesel fuel crashed on the east bound lane and spilled the diesel fuel across the both lanes of traffic. The impacted soil from the spill is in the process of being excavated and removed from the referenced site. On the eastbound shoulder, the cleanup area is approximately 80 feet long, up to 30 feet wide, and up to 3 feet deep (see Figure 2). On the west-bound shoulder, the cleanup area is 380 feet long, up 40 feet wide, and at varying depth (see Figure 3). Most of the excavated length of the westbound shoulder, however, is narrow and drops off to a steep slope towards Lindsey Lake. Impacted snow and other debris were removed from the slope downhill of the shoulder.

Once contaminated soil impacted from the spill has been satisfactorily removed, in accordance with ORS 466 and 468B, and OAR 340-142, confirmed by soil sample analytical results and approved by ODOT geotechnical and Unified Command (see attached signature page), TDC recommends that the shoulders in both directions be restored as follows:

GENERAL

Subgrade Recommendations. The subgrade for the proposed backfill shall be firm and non-yielding. In areas that are wide enough, the subgrade shall be proof rolled with a loaded 12-yard dump truck or equivalent. Measured deflections shall be ¼-inch or less. Soft areas shall be overexcavated to a minimum of 12 inches and firm, non-yielding soil and then backfilled with the Shoulder Aggregate (see below).

Shoulder Aggregate Recommendations. The excavation along the shoulders shall be backfilled with Shoulder Aggregate (Oregon Department of Transportation 02640):

Table 1 –Shoulder Aggregate Specifications (02640)

Size	1" – 0 % Passing (by Weight)	¾" – 0 % Passing (by Weight)
1 ½"	100	
1"	90 – 100	100
¾"	-	90 – 100
¼"	40 – 55	40 – 60

The Shoulder Rock, Pit Run and imported soils shall be free of organics, ice, and other deleterious materials. All fill and soils will also be certified contaminant and weed free.

Shoulder Aggregate Compaction Recommendations. Where required and appropriate, the Shoulder Aggregate shall be placed in 12-inch loose lifts and compacted with a vibratory plate or a hoe pack to negligible deflection.

Downhill Slope Grading. The slope downhill of the shoulder shall be graded no steeper than a 1(H):1(V). In areas where the downhill surficial soils have been disturbed, Pit Run (3 or 6-inch minus; well-graded, coarse- to fine-grained material) rock shall be placed.

Vapor Barrier Recommendations. If required, a vapor barrier shall consist of Seaman Corp XR-5® or Seal Tight Perminator EVOC membrane, or equivalent. The vapor barriers shall be installed at 2 feet below the surface on a firm subgrade. To protect the vapor barrier, a non-woven geotextile shall be placed directly on top of the subgrade and a second layer shall be placed on top of the vapor barrier. For subgrade slope exceeding 5(H):1(V), the slope shall be benched in at 2(H):1(V) to prevent future sloughing (West bound shoulder only). The vapor barrier shall be overlapped at least 12 inches and sealed with 4-inch tape, as provided by selected manufacture. The vapor barrier and non-woven geotextile shall be backfilled with the Shoulder Aggregate, as discussed above.

Erosion Control Measures. Erosion control measures shall be installed on the down slope of the east bound and west bound shoulders, in accordance with standard Best Management Practices and ODOT Erosion Control Manual (April 2005), prior to start of backfilling activities.

RESTORATION PLAN

The final remediation and restoration of the Lindsey Lake shoreline, including any revegetation, will be performed in accordance with a restoration plan currently being developed. This plan will be based on the recommendations contained in the attached NOAA SCAT Recommendations Memorandum Dated February 26, 2019.

I-84 EAST BOUND SHOULDER SPECIFIC REQUIREMENTS

I-84 East Bound Backfill. The deeper portions of the open excavation on the east-bound shoulder will backfilled and compacted partially using Pit Run (6"-minus; well-graded coarse- to fine grained material). The final lift shall include 16 inches of ¾-inch minus Shoulder along the trail, and 12 inches of Top Soil shall be placed between ¾-inch minus Shoulder and Jersey Barrier. Top Soil to be compacted by tamping using an excavator bucket or vibratory compactor. Area will be re-seeded and seed will be provided by Oregon Parks and Recreation Department (OPRD). Soil and seeding application shall be coordinated with OPRD.

I-84 East Bound Erosion Control. On the east-bound shoulder, if required, straw wattles shall be placed for the length of the remediated area (see Figures 2 and 4). Following backfill the area will be stabilized by placing compost blanket.

I-84 WEST BOUND SHOULDER SPECIFIC REQUIREMENTS

I-84 West Bound Backfill. The open excavation on the west-bound shoulder will backfilled and compacted completely using ¾-inch or 1-inch-minus Shoulder Aggregate adjacent to the highway (as removed) and with Pit Run (3-inch or 6-inch minus; well-graded coarse- to fine grained material) rock on the downhill slopes where soils have been disturbed. Additional comments from ODOT, not received as of approval of current plan, will be incorporated in a subsequent amendment to this plan.

I-84 West Bound Erosion Control. On the west-bound shoulder, straw wattles shall be placed at the toe of the slope adjacent to the northern extent of the excavation (see Figures 3 and 4). Multiple rows of straw wattles will be installed if initially placed below high water level. Silt fencing shall be installed approximately 2 feet from the northern edge of the straw waddle. The straw wattles and silt fences shall be installed the total length of the remediated area. As a tertiary BMP a containment boom with a 20-inch skirt (touching the floor of the lake) is located adjacent to the southern shoreline of Lindsey Lake and will to aid in reduction of turbidity should the above BMPs fail. A sediment boom may be required, adjacent to the primary containment boom, if sediment is observed entering the lake.

Please note: Both the wattles and silt fence will be installed outside of the native vegetation in the natural wooded wetland areas within the confines of an invasive species located on the slope adjacent to the excavation. If access to the wooded peninsula is necessary to complete work, foot traffic through this area should be minimized. Special precaution should also be taken to prevent transport of contaminants which could potentially drive oily residues into the soft soil area

wetland (see attached NOAA SCAT Recommendations Memorandum Dated February 26, 2019).

I-84 West Bound Vapor Barrier. Subgrade slope exceeding 5(H):1(V) will require benching cut in at 2(H):1(V) to prevent future sloughing.

LIMITATIONS

Our conclusions and recommendations are based on our February 22, 2019 Site Visit. No subsurface investigation was conducted at that time. The conclusions and recommendations in this report are based on the information provided to us, results of the visual site observations, and professional judgment. We have observed only a small portion of the pertinent soil and groundwater conditions. The recommendations are based on the assumptions that the soil conditions do not deviate appreciably for those encountered during our site visit. This report is issued with the understanding that it is the responsibility of the Client to ensure that the recommendations are communicated to their clients. Geotechnical engineering is characterized by a certain degree of uncertainty. Professional judgments presented are based partly on our understanding of the proposed construction and partly on our general experience. Our engineering work and judgments rendered meet current professional standards; no other warranties, either expressed or implied are made. This report is subject to review and should not be relied upon after a period of 3 years.

It has been a pleasure providing you the geotechnical services for this project. If you have any questions, please call at 503.502.5114.

Sincerely,
Terra Dolce Consultants, Inc.

Cynthia L. Hovind, P.E., G.E.
Professional Geotechnical Engineer, OR-**17857PE**

Attachments:
Signatures
Figure 1 – Vicinity Map
Figure 2 - East Bound Lane
Figure 3 – West Bound Lane
Figure 4 - Erosion Control Notes and Details
Vapor Barrier Specifications
NOAA SCAT February 26 2019 Recommendations Memorandum

SIGNATURES:

Backfill Plan Approved: 2/28/2019

_____ **FOSC**

2/28/2019/1527 **SOSC**

2/28/2019/1528 **RPIC**

Eastbound Shoulder Backfill Approved: 2/28/2019

_____ **FOSC**

2/28/2019/1527 **SOSC**

2/28/2019/1528 **RPIC**

Westbound Shoulder Backfill Approved: _____

_____ **FOSC**

_____ **SOSC**

_____ **RPIC**

SIGNATURES:

Backfill Plan Approved: 2/28/2019

JEFFREY FOWLOW Digitally signed by JEFFREY FOWLOW Date: 2019.03.01 15:30:49 -08'00' **FOSC**

2/28/2019 / 1527 **SOSC**

2/28/2019 / 1528 **RPIC**

Eastbound Shoulder Backfill Approved: 2/28/2019

JEFFREY FOWLOW Digitally signed by JEFFREY FOWLOW Date: 2019.03.01 15:31:49 -08'00' **FOSC**

2/28/2019 / 1527 **SOSC**

2/28/2019 / 1528 **RPIC**

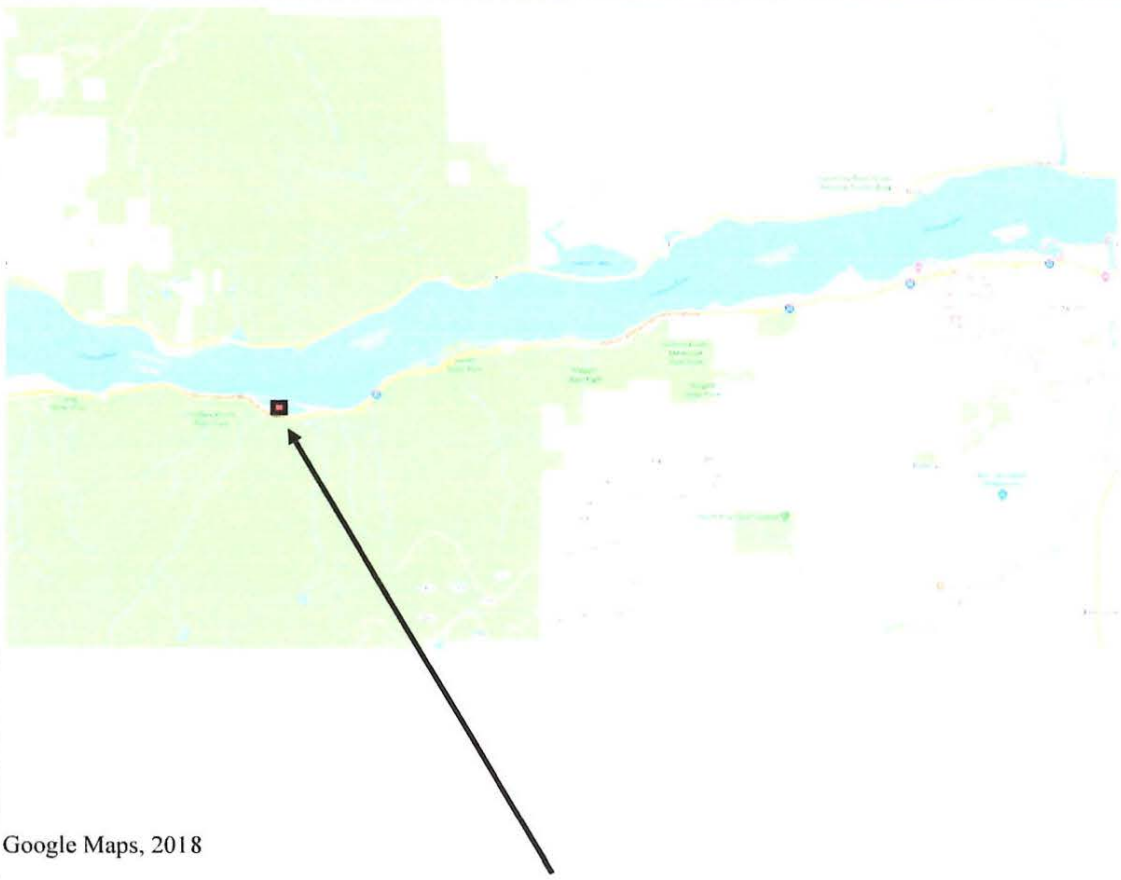
Westbound Shoulder Backfill Approved: _____

Approved by Amendment **FOSC**

_____ **SOSC**

_____ **RPIC**

EV-Leader
3/1/19



Google Maps, 2018

SITE

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Terra Dolce Consultants, Inc. 4706 NE 75th Ave Portland, Oregon 97218 Phone 503.502.5114 Fax 503.206-5114		Hydro Con, LLC 1-84 Spill Response Cleanup Hood River, Oregon	
Project No. 864-001	**February 25, 2019**	**Vicinity Map**	**Figure 1**

~~Draft- for discussion purposes only~~

Space Age Diesel Spill
I-84 Mile Marker 54
Cascade Locks, OR

0 15 30 60 90 120 Feet

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	Terra Dolce Consultants, Inc. 4706 NE 75th Ave Portland, Oregon 97218		Hydro Con, LLC I-84 Lindsey Lake Emergency Spill Reponse Hood River, Oregon	
	Project No. 864-001	February 28, 2019	East Bound Lane	Fig 2

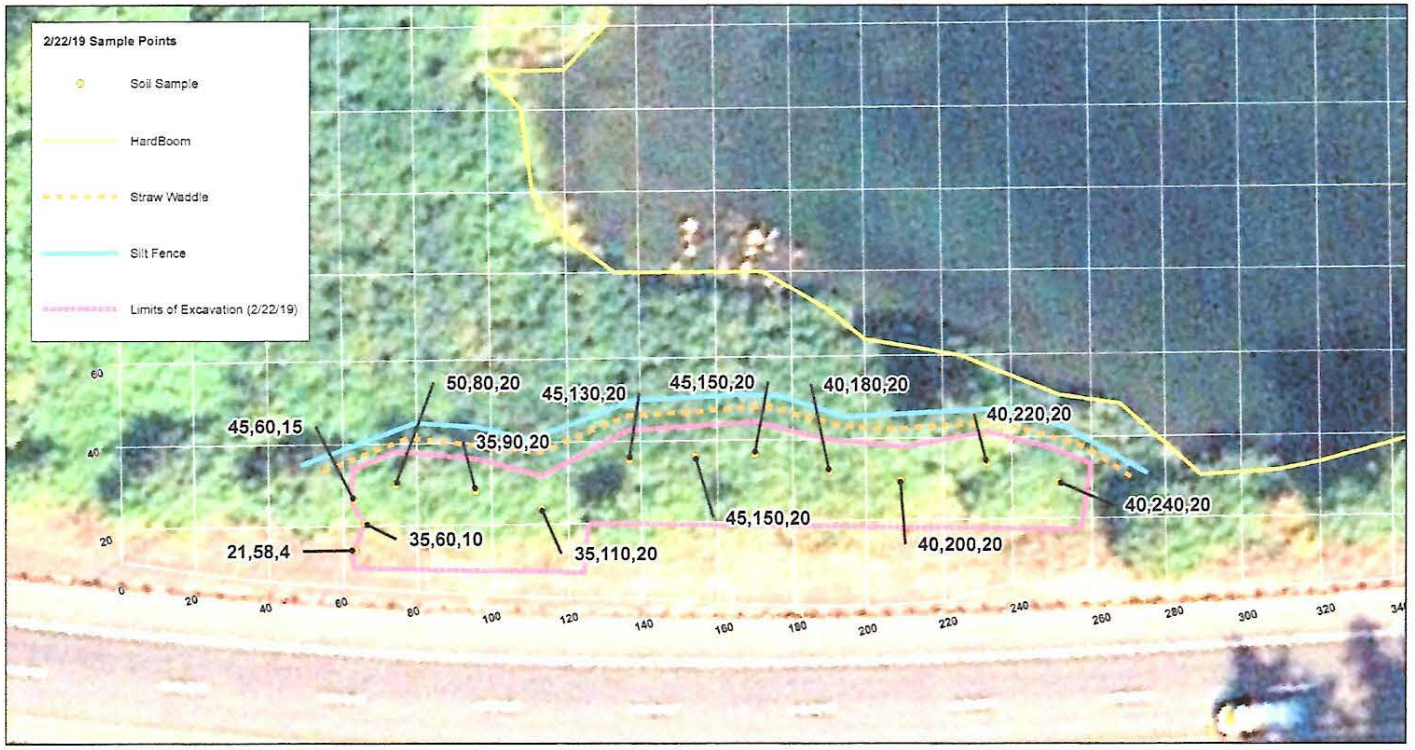

Figure 2. Erosion Control and Containment ~~Draft- for discussion purposes only.~~

Space Age Diesel Spill
I-84 Mile Marker 54
Cascade Locks, OR

0 15 30 60 90 120 Feet

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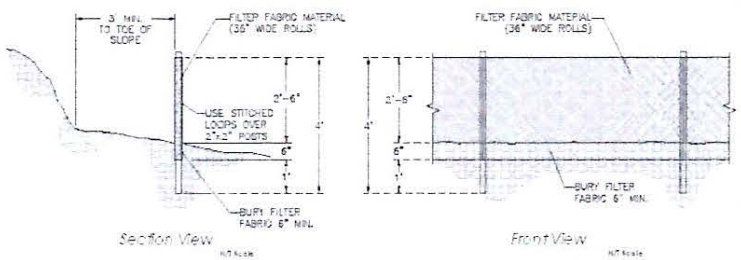
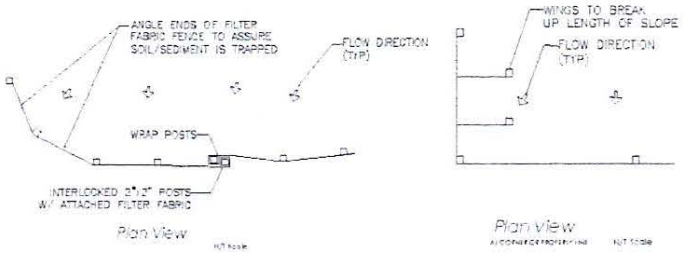
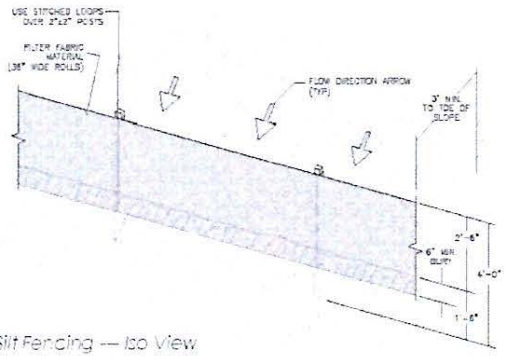
REVISIONS	Terra Dolce Consultants, Inc. 4706 NE 75th Ave Portland, Oregon 97218		Hydro Con, LLC I-84 Lindsey Lake Emergency Spill Reponse Hood River, Oregon	
	Project No. 864-001	February 28, 2019	West Bound Lane	Fig 3





Erosion Control Details (Typ)



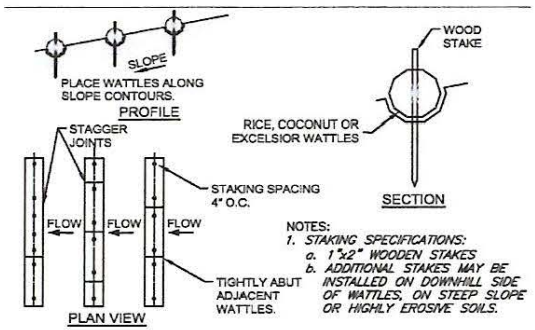
Silt Fencing -- Iso View

STANDARD NOTES FOR EROSION CONTROL

A. APPROVAL OF THIS EROSION, SEDIMENT AND POLLUTION CONTROL PLAN (ESPCP) DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G., SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
B. THE IMPLEMENTATION OF THIS ESPCP AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESPCP FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
C. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
D. THE ESPCP FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
E. THE ESPCP FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESPCP FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
F. THE ESPCP FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
G. THE ESPCP FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
H. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

STANDARD NOTES FOR SEDIMENT FENCES:

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST, OR OVERLAP 2 INCH X 2 INCH POSTS AND ATTACH AS SHOWN ON DETAIL PROVIDED.
2. THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS WHERE FEASIBLE. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24 INCHES.
3. THE FILTER FABRIC SHALL HAVE A MINIMUM VERTICAL BURIAL OF 6 INCHES. ALL EXCAVATED MATERIAL FROM FILTER FABRIC FENCE INSTALLATION, SHALL BE BACKFILLED AND COMPACTED, ALONG THE ENTIRE DISTURBED AREA.
4. STANDARD OR HEAVY DUTY FILTER FABRIC FENCE SHALL HAVE MANUFACTURED STITCHED LOOPS FOR 2 INCH X 2 INCH POST INSTALLATION. STITCHED LOOPS SHALL BE INSTALLED ON THE UP HILL SIDE OF THE SLOPED AREA.
5. FILTER FABRIC FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED.
6. FILTER FABRIC FENCES SHALL BE INSPECTED BY APPLICANT/CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.



NOTES:
1. *STAKING SPECIFICATIONS:*
   a. *1"x2" WOODEN STAKES*
   b. *ADDITIONAL STAKES MAY BE INSTALLED ON DOWNHILL SIDE OF WATTLES, ON STEEP SLOPE OR HIGHLY EROSIVE SOILS.*

	Terra Dolce Consultants, Inc. 4706 NE 75th Ave Portland, Oregon 97218		Hydro Con, LLC 1-84 Lindsey Lake Emergency Spill Reponse Hood River, Oregon
	Project No. 864-001	February 28, 2019	Erosion Control Notes and Details — Fig 4

VAPOR BARRIER SPECIFICATIONS

XR-5® By Seaman Corporation

High Performance XR-5® 8130 Reinforced Geomembrane

XR-5® 8130 Reinforced	Test Method	Standard	Metric
Base Fabric Type **Base Fabric Weight (nominal)**	**ASTM D751**	Polyester 6.5 oz/yd²	Polyester 220 g/m²
Thickness	**ASTM D751**	30.0 mils min	0.76 mm min
Weight	**ASTM D751**	30.0 ± 2 oz/yd²	1017 ±70 g/m²
Tear Strength	**ASTM D4533** **Trapezoid Tear**	40/55 lb min	175/245 N min
Breaking **Yield Strength**	**ASTM D751** **Grab Tensile**	550/550 lb min	2448/2448 N min
Low Temperature **Resistance**	**ASTM D2136** **4 hr - 1/8" mandrel**	Pass @ -30° F	Pass @ -34° C
Dimensional Stability	**ASTM D1204** **212° F / 100° C - 1 hr**	0.5% max each direction	0.5% max each direction
Adhesion **Heat Sealed Seam**	**ASTM D751** **Dielectric Weld**	40 lb/2 in min	17.5 daN/5 cm min
Dead Load **Seam Strength**	**ASTM D751** **4-hour test**	2 in seam, 4 hrs, 1 in strip Pass 240 lb @ 70° F Pass 120 lb @ 160° F	5 cm seam, 4 hrs, 2.5 cm strip Pass 1068 N/2.54cm @21° C Pass 534 N/2.54cm @ 70° C
Bursting Strength	**ASTM D751** **Ball Tip**	750 lb min	3330 N min

1000 VENTURE BLVD. WOOSTER, OHIO 44691 USA, U.S. Toll-Free: Phone 800-927-8578, Fax 800-649-2737
Phone 330-262-1111, Fax 330-263-6950 www.xr-5.com

XR-5® By Seaman Corporation

High Performance XR-5® 8130 Reinforced Geomembrane

XR-5® 8130 Reinforced	Test Method	Standard	Metric
Hydrostatic Resistance	ASTM D751 Procedure A	800 psi min	5.51 MPa min
Blocking Resistance	ASTM D751 180° F / 82° C	#2 Rating max	
Adhesion - Ply	ASTM D413 Type A	15 lb/in min or Film Tearing Bond	13 daN/5 cm min or Film Tearing Bond
Bonded Seam Strength	ASTM D751 Grab Test Method Procedure A	550 lb min	2450 N min
Abrasion Resistance	ASTM D3389 H-18 Wheel 1kg Load	2000 cycles (min) before fabric exposure 50 mg/100 cycles maximum weight loss	
Weathering Resistance	ASTM G153 (Carbon-Arc)	8000 hrs (min)-No appreciable changes or stiffening or cracking of coating	
Water Absorption	ASTM D471 Section 12 7 Days	0.025 kg/m² max @ 70° F/21° C 0.14 kg/m² max @ 212° F/100° C	
Wicking	ASTM D751	1/8 in max	0.3 cm max
Puncture Resistance	ASTM D4833	275 lb min	1200 N min
Coefficient Of Thermal Expansion/Contraction	ASTM D696	8×10^{-6} in/in/°F max	1.4×10^{-5} cm/cm/°C max
Environmental/Chemical Resistant Properties		See Chemical Resistance Table	
Puncture Resistance	FED-STD 101C Method 2031	350 lb (approximate)	1550 N (approximate)

Seaming: Thermal welding methods are recommended. No glues or solvents are suggested.

Revised April 2009

PRODUCT DATA

NO. 723-D

MasterFormat:
03 33 00
07 26 23
07 26 16

W. R. MEADOWS
SEALTIGHT

MAY 2018
(Supersedes July 2017)

PERMINATOR® EVOH

Underslab Gas Vapor Barrier

DESCRIPTION

PERMINATOR EVOH is a seven-layer co-extruded barrier manufactured from state-of-the-art polyethylene and EVOH resins. Designed to provide superior resistance to gas and moisture transmission, PERMINATOR EVOH is a highly resilient underslab gas/vapor barrier designed to restrict naturally occurring gases, such as radon, methane, gasoline, solvents, oils, and hydrocarbons, from migrating through the ground and into the concrete slab.

USES

When properly installed, PERMINATOR EVOH resists gas and moisture migration into the building envelope to provide protection from toxic/harmful chemicals. It can be installed as part of a passive or active control system extending across the entire building, including floors, walls, and crawl spaces. PERMINATOR EVOH protects flooring and other moisture-sensitive furnishings in the building's interior from moisture and water vapor migration, greatly reducing condensation, mold, and degradation.

FEATURES/BENEFITS

- Resistant to gasoline, oils, solvents, hydrocarbons, radon, and methane.
- Available in 150' (45.7 m) long rolls.
- Helps reduce the penetration of moisture and water vapor through the slab into the structure.
- Helps reduce fungus, mildew, and mold.
- Tough enough to withstand normal construction jobsite conditions and traffic … will not crack, puncture, snag, split, or tear easily.
- Seven-layer construction with EVOH gas barrier core.

PACKAGING

10' (3 m) x 150' (45.7 m) Rolls

SPECIFICATIONS

- Meets or exceeds all requirements of ASTM E 1745-11 Class A, B & C.

APPLICATION

Surface Preparation … Level, tamp, or roll earth or granular material beneath the slab base as specified by supplied architectural drawings. Follow ASTM E-1643-10 (standard practice and procedure for installation of vapor retarder used in contact with earth or fill under concrete slabs). Reference American Concrete Institute (ACI) 302.1R-15 Section 6.1.4 – Base Material for sub-grade preparation prior to placement of PERMINATOR.

Horizontal Application … Unroll 150' (45.7 m) PERMINATOR EVOH over the area where the slab is to be poured. Cut to size if necessary. PERMINATOR should completely cover the pour area. All joints/seams, both side and end, should be overlapped 12" (304.8 mm) and taped using 4" (101.6 mm) wide PERMINATOR EVOH TAPE. (Note: The PERMINATOR EVOH TAPE area of adhesion should be free from dust, dirt, and moisture to allow maximum adhesion of the pressure-sensitive tape.) To ensure placement of laps, PERMINATOR BUTYL TAPE should be used underneath the overlap area to hold membrane in place as PERMINATOR EVOH TAPE is applied.

The most efficient installation method includes placing PERMINATOR EVOH on top of the footing and against the vertical wall. This will sandwich PERMINATOR EVOH between the footing, vertical wall, and poured concrete floor. This will help protect the concrete slab from external moisture sources once the slab has been placed.

Before placing concrete slab, make sure all penetrations, block outs, and damaged areas are repaired/addressed. For detailed information on detailing penetrations, such as pipe clusters, please refer to INSTALLATION GUIDELINES: PERMINATOR EVOH PENETRATIONS available at www.wrmeadows.com.

Numerous municipal building codes do not allow the placement of vapor barriers over the footing, due to breaking of the bond between the wall and footing. Although this is not an optimal application method, W. R. MEADOWS approves this alternate method when required by building code.

CONTINUED ON REVERSE SIDE…

W. R. MEADOWS, INC.
P.O. Box 338 • HAMPSHIRE, IL 60140-0338
Phone: 847/214-2100 • Fax: 847/683-4544
1-800-342-5976
www.wrmeadows.com

TECHNICAL DATA

Properties	Test Method	Result
Appearance		White/Green
Thickness, Nominal		20 Mil (0.51 mm)
Weight		102 lb./MSF (498 g/m^2)
Classification	ASTM E 1745	Class A, B, and C
Tensile Strength	ASTM E 154, Section 9, (D-882)	58 lbf (102 N)
Impact Resistance	ASTM D 1709	2600 g
Permeance (New Material)	ASTM E 154, Section 7 ASTM E 96, Procedure B	0.0098 Perms grains/(ft^2·hr·in·Hg) [0.0064 Perms g/(24hr·m^2·mm Hg)]
Permeance (After Conditioning) (Same Measurement as Above Performance)	ASTM E 154 Section 8, E96 Section 11, E96 Section 12, E96 Section 13, E96	 0.0079 (0.0052) 0.0079 (0.0052) 0.0097 (0.0064) 0.0113 (0.0074)
WVTR	ASTM E 96 Procedure B	0.0040 grains/hr-ft^2 (0.0028 gm/hr-m^2)
Benzene Permeance	Aqueous Phase Film Permeance	1.57E-10 m/s
Toluene Permeance	Aqueous Phase Film Permeance	2.18E-10 m/s
Ethylbenzene Permeance	Aqueous Phase Film Permeance	1.71E-10 m/s
M & P Xylenes Permeance	Aqueous Phase Film Permeance	1.62E-10 m/s
O Xylene Permeance	Aqueous Phase Film Permeance	1.53E-10 m/s
Perchloroethylene (PCE)	Aqueous Phase Film Permeance	1.5 x 10^{-9} m/s
Trichloroethylene (TCE)	Aqueous Phase Film Permeance	2.4 x 10^{-9} m/s
Radon Diffusion Coefficient	K124/02/95	< 1.1 x 10^{-13} m^2/s
Methane Permeance	ASTM D 1434	3.68E-^{12} m/s Gas Transmission Rate (GTR): 0.32 mL/m^2•day•atm
Maximum Static Use Temperature		180° F (82° C)
Minimum Static Use Temperature		-70° F (-57° C)

LEED INFORMATION

May help contribute to LEED credits:

- EAp2: Minimum Energy Performance
- EAc2: Optimize Energy Performance
- MRc9: Construction and Demolition Waste Management

For CAD details, most current data sheet, further LEED information, and SDS, visit www.wrmeadows.com.

LIMITED WARRANTY

W. R. MEADOWS, INC. warrants at the time and place we make shipment, our material will be of good quality and will conform with our published specifications in force on the date of acceptance of the order. Read complete warranty. Copy furnished upon request.

Disclaimer

The information contained herein is included for illustrative purposes only, and to the best of our knowledge, is accurate and reliable. W. R. MEADOWS, INC. cannot however under any circumstances make any guarantee of results or assume any obligation or liability in connection with the use of this information. As W. R. MEADOWS, INC. has no control over the use to which others may put its product, it is recommended that the products be tested to determine if suitable for specific application and/or our information is valid in a particular circumstance. Responsibility remains with the architect or engineer, contractor and owner for the design, application and proper installation of each product. Specifier and user shall determine the suitability of products for specific application and assume all responsibilities in connection therewith.

NOAA SCAT
FEBRUARY 26, 2019 RECOMMENDATIONS MEMORANDUM

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Response and Restoration
7600 Sand Point Way
Seattle, WA 98115

February 26, 2019

MEMORANDUM FOR: Unified Command – Lindsey Lake Tanker Truck Spill

FROM: Matthew Bissell, NOAA

SUBJECT: Shoreline Cleanup Assessment and Recommendations

The following observations and recommendations are offered after a visit (2/22/19) to the site of the Lindsey Lake Tanker Truck Spill. The visit occurred 12 days after the release of 4,400 gallons of diesel on I-84 near Lindsey Lake on the Columbia River. At this time, numerous response strategies were effectively placed and well maintained. Seven segments of boom spanning Lindsey Creek were sufficient for current water levels. Boom was clean and no sheen was observed in the creek. Patches of silver sheen were observed in the area adjacent to the highway, east of the peninsula. This sheen was extremely light and was contained within a small area by multiple layers of boom (hard and sorbent). The cold conditions caused the sorbent boom and pads to freeze. This seemed to be temporarily inhibiting the recovery of the spilled product. However, the well-placed booms and rows of sorbent pads (as well as the lake's frozen surface layer) were effective at containing the oil along the shore near the highway. As temperature increases sorbent material will thaw and should become more effective at retaining residual oil.

While Lindsey Lake is a highly altered landscape, adjacent to highway and railroad, the area is important habitat for several species of fish, birds, and mammals. Of concern, the lake and adjoining creeks are habitat for Steelhead and Coho salmon. It is still early in the year for juvenile fish born in Lindsey Creek to begin migrating downstream; typical patterns would predict this migration to occur in early spring. However, due to a warmer than average December and January, it is possible to see an early commencement of this migration at this time. Because diesel fuels are particularly toxic to larval and juvenile stages of these fish, the extent and duration of environmental recovery in this response is important. More resources will be at risk of exposure in April and May than are currently present in the area.

The following are recommendations:

(1) Continue to monitor for sheen in creek as ice melts and water levels fluctuate. Continue to replace boom as necessary. Should observations or water samples indicate continued or increasing contamination of creek or lake, please notify NOAA (matthew.bissell@noaa.gov).

(2) The wooded peninsula within Lindsey Lake is important habitat for birds and mammals. Foot traffic through this area should be minimized. Response personnel working in the

hot zone can transport contaminants and drive oily residues into the soft soil. This unintentional burial of contaminants can prolong the natural oil degradation process.

(3) The area of excavation along the highway is adjacent to the wooded peninsula. After back-filling operations are complete, best practice would be to replace any vegetation incidentally removed during excavation.

(4) If excavation and/or back-fill operations are observed to negatively affect water quality, a silt curtain may be used to decrease turbidity and minimize the spread of contaminants.

(5) Water quality analysis should continue in creek and lake until source oil is no longer detectable.

Figure 1: Foot traffic should be minimized in area along peninsula adjacent to hot zone.

Figure 2: Potential area for replanting native species after excavation.

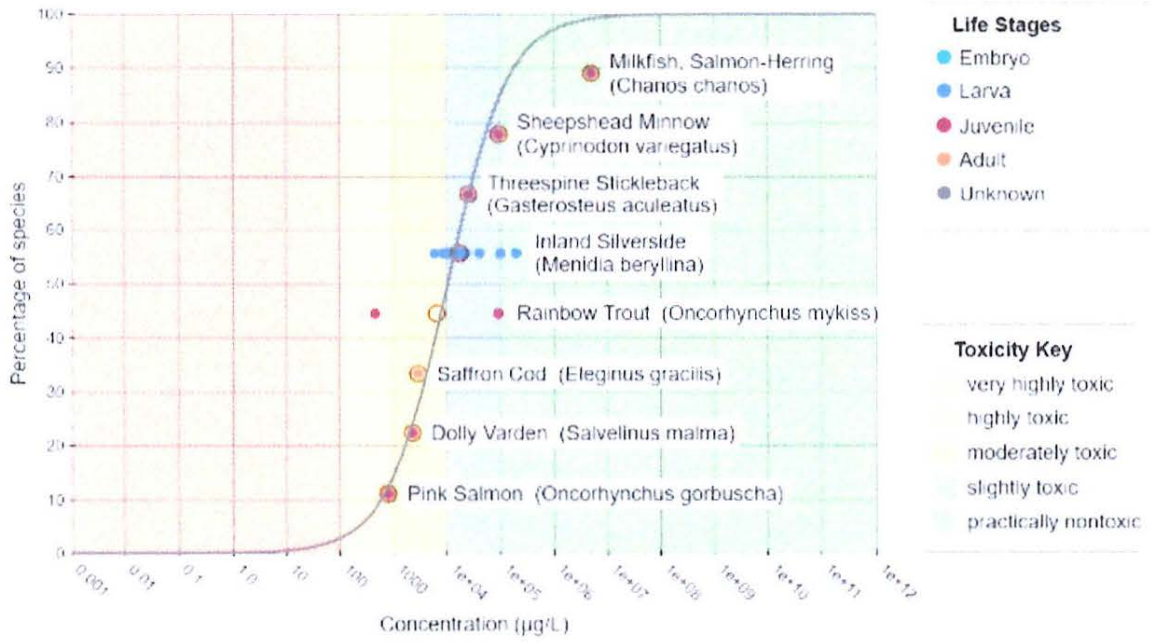


Figure 3: Species sensitivity (LC50) index for diesel fuel.

Backfill Plan – REV 1 – Amendment: The following amendment is an addition to the Backfill Plan

I-84 WEST BOUND SHOULDER SPECIFIC REQUIREMENTS

I-84 West Bound Backfill. A topography survey will be completed on the extent of the remediation excavation and adjacent existing slope areas prior to backfill. If ODOT provides a survey of preexisting conditions, the slope will be backfilled to the preexisting grade. If no survey data is available, the slope will be backfilled to adjacent existing grades

I-84 West Bound Erosion Control. Silt fence and straw waddles are to be placed at least one foot above the current water level of Lindsey Lake. The last ten feet of the eastern and western extent of silt fence shall be installed to the south (up hill) to prevent fish from potentially getting trapped between the silt fence and straw waddle, if the water level should significantly rise.

Approved By:

FOSC

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JEFFREY FOWLOW Digitally signed by JEFFREY FOWLOW
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